

Section 3. Natural Gas

Natural gas prices are developed for the residential, commercial, industrial, transportation, and electric utility sectors. Reported natural gas prices are retail prices for sales of natural gas to ultimate users.

In general, taxes are included in the prices. However, taxes collected by a utility from an end user and turned over to a Government authority frequently are not included in the revenues reported in the source documents and, therefore, are not included in the prices. Taxes paid by the utility (rather than the end user) are considered operating costs and are passed on to the end user as part of the rate. Therefore, Federal, State, business, and property taxes are typically included in the prices, while sales and other point-of-purchase taxes typically are not.

Estimates of the amount of natural gas consumed by the residential, commercial, industrial, and electric utility sectors are taken from the Combined State Energy Data System (CSEDS). Estimates for the industrial sector are adjusted to remove estimated refinery consumption and lease and plant use of natural gas, and estimates of transportation sector use are adjusted to remove pipeline fuel in each State. (See the discussion in Section 7, "Consumption Adjustments for Calculating Expenditures," on page 417.)

Residential, Commercial, and Industrial Sectors

Prices: 1987 Forward

All natural gas physical unit prices by State for the residential, commercial, and industrial sectors are taken from the Energy Information Administration (EIA) *Natural Gas Annual* (NGA).

Prices: 1970 Through 1986

All natural gas physical unit prices for the residential, commercial, and industrial sectors are calculated from value and quantity of sales data from the NGA or its predecessor report, *Natural Gas Production and Consumption*. State prices are calculated directly from the data sources as average revenue per unit of sales by natural gas utilities. Prices for each of the three sectors are calculated by dividing the value of natural gas, reported in thousands of dollars, by the quantity of natural gas sold, as reported in million cubic feet.

For 1970 through 1979, both the value and quantity of sales data from the NGA are reported as composites for MD and DC and for ME, NH, and VT. In each case, the combined prices are assigned to each of the States in the composite.

Btu Prices: All Years

State Btu prices for all years are calculated by using the physical unit price series and the State-level non-electric utility conversion factors. U.S. Btu prices are calculated as the average of the State Btu prices, weighted by consumption data from CSEDS, adjusted for process fuel consumption in the industrial and transportation sectors.

Data Sources

Prices

1987 forward: Energy Information Administration, *Historical Natural Gas Annual, 1930 Through 1997*, Table 23 (residential); Table 24

(commercial 1987–1992) and Table 25 (commercial, 1993 forward); and Table 27 (industrial 1987–1992) and Table 28 (industrial, 1993 forward).

1980–1986: Calculated from quantity and value data published in the Energy Information Administration, *Natural Gas Annual, Volume 1*, Table 11 (1980), Table 14 (1981–1985), and Table 15 (1986). Comparable price data are available in the *Historical Natural Gas Annual, 1930 Through 1997*, Table 23 (residential), Table 24 (commercial), and Table 27 (industrial).

1970–1979: Calculated from quantity and value data published in the Bureau of Mines, U.S. Department of the Interior, *Natural Gas Production and Consumption*, Table 6 (1970 and 1979) and Table 7 (1971–1978). Comparable price data are available in the *Historical Natural Gas Annual, 1930 Through 1997*, Table 23 (residential), Table 24 (commercial), and Table 27 (industrial).

Consumption

1970 forward: Energy Information Administration, Combined State Energy Data System, residential, commercial, and industrial natural gas consumption.

Conversion Factors: All Years

Energy Information Administration, factors published rounded in *State Energy Data Report 1997 Consumption Estimates*, Tables C4 and C5.

Transportation Sector

Most of the natural gas used for transportation is consumed in pipeline operations and is discussed in Section 7, “Consumption Adjustments for Calculating Expenditures,” on page 417. A small but increasing portion is consumed by natural gas vehicles. Prices for natural gas consumed by vehicles are reported in the EIA *Natural Gas Annual* beginning in 1990. Much of the natural gas delivered for vehicle fuel represents deliveries to fueling stations that are used primarily by fleet vehicles.

In the first years of the vehicle fuel price series, the coverage of the reporting universe is not complete. Prices are assigned, when missing,

from an adjacent State with the highest percentage of reported data. Natural gas vehicle fuel consumption for NE is assigned the SD price in 1992, 1993, and 1995; NV is assigned the AZ price in 1992 and 1993; and DE is assigned the MD price in 1994.

Data Sources

Prices

1990 forward: Energy Information Administration, *Historical Natural Gas Annual, 1930 Through 1997*, Table 30.

Consumption

1990 forward: Energy Information Administration, Combined State Energy Data System, natural gas vehicle consumption.

Conversion Factors: All Years

Energy Information Administration, unrounded conversion factors as published rounded in the *State Energy Data Report 1997, Consumption Estimates*, Tables C4 and C5.

Electric Utility Sector

Prices: 1973, 1974, 1983 Forward

Prices for States are reported by *Cost and Quality of Fuels for Electric Utility Plants (C&Q)* for gas consumed at steam-electric plants only. Btu prices are taken from C&Q, converted from cents to dollars per million Btu.

Where individual State prices are unavailable from C&Q, they are developed from the *NGA*. Physical unit prices prior to 1987 are calculated by dividing the value of natural gas, reported in thousands of dollars, by the quantity of natural gas sold, reported in million cubic feet. For 1987 forward, physical unit prices are taken directly from the *NGA*. Table A11 lists the States and years for which *NGA* data are used. Btu prices

Table A11. Natural Gas Electric Utility Sector Prices from NGA, 1973 Forward

State	Years
AK	1973–1990
CT	1974–1976
ID	1983–1986
MD	1973, 1974, 1983–1985
NC	1983–1990
ND	1973, 1974, 1976–1986
NH	1973, 1974, 1977, 1987–1989
PA	1973
RI	1976, 1980
SC	1977
SD	1983–1990
TN	1976, 1980, 1981, 1983, 1988–1996
UT	1988, 1989
VT	1983–1985, 1989, 1990
WA	1978, 1983–1985, 1988, 1989
WY	1973, 1975

Note: NGA includes predecessor publications.

are calculated from the physical unit prices by using State-level electric utility conversion factors.

Prices are not available from either *C&Q* or *NGA* for CT in 1973; ID in 1974, 1987; NH in 1983, 1996; OR in 1983, 1984, 1986, 1989, 1990; SD in 1997; and TN in 1997. In these cases, quantity-weighted Census division prices from *C&Q* are assigned. In addition, prices for VT in 1986 and WA in 1986, 1987, 1990 use quantity-weighted Census division prices from *C&Q* for more consistent prices than those available from the *NGA*.

Prices: 1980 Through 1982

State Btu and physical unit prices for 1980 through 1982 are taken from *C&Q* for all reporting plants. Physical unit prices are taken directly from the data source, while Btu prices are converted from cents to dollars per million Btu.

Prices: 1975 Through 1979

State prices are reported separately by *C&Q* for gas consumed at steam-electric plants and gas consumed at combustion turbine and internal combustion units. Weighted-average Btu prices are calculated by using the two *C&Q* prices and the respective gas deliveries for steam-electric and combustion use. The NH price in 1977 is not available from *C&Q*. A combined price is computed from value and quantity of sales data from the *NGA* for ME, NH, and VT and assigned to NH for 1977.

Prices: 1970 Through 1972

State prices for 1970 through 1972 are taken from *Natural Gas Production and Consumption* and are calculated similarly to the way prices for the residential, commercial, and industrial sectors are calculated. Prices, as average revenue per unit of sales, are computed from value and quantity of sales data from the source reports. A combined price is reported for NH and VT for 1971 and 1972, and each of these States is assigned the combined price. State Btu prices are calculated from the physical unit prices by using the State-level electric utility conversion factors.

U.S. Prices: All Years

U.S. Btu prices are calculated as the average of the State Btu prices, weighted by consumption data from CSEDS.

Data Sources

Prices

1973 forward: Energy Information Administration, *Cost and Quality of Fuels for Electric Utility Plants*, tables shown in Table A12.

1990 forward: Energy Information Administration, *Historical Natural Gas Annual 1930 Through 1997*, Table 31.

1980–1989: Energy Information Administration, *Natural Gas Annual 1992, Volume 2*, Table 23.

Table A12. Tables from EIA *Cost and Quality of Fuels for Electric Utility Plants* Used as Data Sources

Years	Price Data	Volume Data
1973, 1974	Table 10	Table 9
1975–1979	Table 10, 16	Table 9, 15
1980–1982	Table 48	-
1983, 1984	Table 53	-
1985–1987	Table 43	-
1988, 1989	Table 44	-
1990, 1991	Table 12 (1994 edition)	-
1992 forward	Table 12 (1996 edition)	-

1976–1979: Energy Information Administration, Energy Data Reports, *Natural Gas Production and Consumption*, Table 7 (1976–1978) and Table 6 (1979).

1970–1975: Bureau of Mines, U.S. Department of the Interior, *Natural Gas Production and Consumption*, Table 6 (1970) and Table 7 (1971–1975).

Consumption

1970 forward: Energy Information Administration, Combined State Energy Data System, electric utility natural gas consumption.

Conversion Factors

Btu prices that are calculated directly from *Cost and Quality of Fuels for Electric Utility Plants (C&Q)* require no conversion factors. When *Natural Gas Annual (NGA)* data are used to develop prices that are missing from *C&Q*, conversion factors are used from the following source:

1970 forward: Energy Information Administration, *State Energy Data Report 1997, Consumption Estimates*, Tables C2 and C3.

Section 4. Petroleum

Asphalt and Road Oil

The Combined State Energy Data System (CSEDS) assumes that all asphalt and road oil consumption occurs in the industrial sector. Asphalt and road oil are used primarily for paving (79 percent of consumption in 1970 and 89 percent in 1997), with the remaining products used for roofing and sealing. Taxes are not included in the prices because most street and highway paving is done under contract to State, county, and other public authorities who are typically exempted from paying taxes.

Physical Unit Prices: All Years

Asphalt prices in physical units are developed from monthly reports in the *Engineering News-Record*, a construction industry weekly magazine published by McGraw-Hill, Inc. The source data consist of monthly reports from correspondents in 20 U.S. cities with price quotes for tank cars, drums, or both, for the three major types of asphalt products: asphalt cement (AC-20), asphalt emulsion (rapid set and slow set), and asphalt cutback.

For 1986 forward, the tank car price is used. However, for 1986 and 1987, the drum price is used if a tank car price is not available. For 1970 through 1985, when both tank car and drum prices are available, a simple average of the two prices is used. When only one price is available, that price is used.

Asphalt prices are developed by calculating a simple average annual price from the monthly prices for each city for the three products. City prices are assigned to States. CA, OH (1970 through 1985, 1992 forward), and PA have prices from two cities; in these cases, simple

averages of the two city prices are used. No States have prices from more than two cities. An outlier data value for Minneapolis in June 1995 was omitted and the MN price for 1995 is an 11-month average. States with no prices are assigned a Census division simple average price. If there is no Census division price, the simple average of the prices for the other Census divisions within that Census region is used.

State average asphalt prices are calculated as the quantity-weighted average prices of the three products for each State. Quantity data for 1970 through 1980 are taken from the Bureau of Mines and EIA reports on sales of asphalt. Quantity data for 1981 forward are taken from the *Report on Sales of Asphalt in the U.S.*, published by the Asphalt Institute. Non-paving asphalts are assumed to have the prices of paving asphalt cement.

For 1970 through 1982, asphalt and road oil are estimated as separate data series. Asphalt prices are estimated as discussed above. Road oil prices are assumed to equal asphalt emulsion prices because specific prices are not available from any source.

Btu Prices: All Years

Asphalt prices in dollars per ton are converted to dollars per gallon by dividing by 235 gallons per ton for asphalt cement, 241 gallons per ton for emulsion, and 248.6 gallons per ton for cutback. These prices are then multiplied by 42 gallons per barrel and divided by 6.636 million Btu per barrel to get dollars per million Btu. Road oil unit prices of dollars per ton are converted to dollars per million Btu by using the constant conversion factors of 5.5 barrels per ton and 6.636 million Btu per barrel. The average price of all asphalt and road oil is the consumption-weighted average of the individual product prices.

U.S. Btu prices are calculated as the average of the State Btu prices, weighted by consumption data from CSEDS.

Data Sources

Prices

1970 forward: McGraw-Hill, Inc., *Engineering News-Record*.

Quantities for Calculating Weighted Average Prices

1981 forward: Asphalt Institute, *Asphalt Usage, United States and Canada*.

1977–1980: Energy Information Administration, Energy Data Reports, *Sales of Asphalt* (1978–1980) and *Asphalt Sales, Annual* (1977), Table 2.

1970–1976: Bureau of Mines, U.S. Department of the Interior, Mineral Industry Survey, *Asphalt Sales, Annual* (1971–1976) and *Asphalt Shipments, Annual* (1970), Table 2.

Consumption

1970 forward: Energy Information Administration, Combined State Energy Data System, industrial sector, asphalt and road oil consumption.

Conversion Factors: All Years

Conversion factors used are: 235 gallons per ton of asphalt cement; 241 gallons per ton of emulsion; 248.6 gallons per ton of cutback; 42 gallons per barrel; 5.5 barrels per ton of road oil; 6.636 million Btu per barrel.

Aviation Gasoline

Aviation gasoline prices are developed for the transportation sector. Estimates of the amount of aviation gasoline consumed by the transportation sector are taken from the Combined State Energy Data

System (CSEDS). Aviation gasoline prices are national averages, excluding taxes, developed from several sources, depending on the years. In all cases, physical unit prices are developed and then converted to Btu prices. Federal and State excise taxes, as well as State and local sales taxes, are not included.

Physical Unit Prices: 1976 Forward

Aviation gasoline prices for 1978 forward are assumed to be the national average refiners sales prices to end users published in the EIA's *Annual Energy Review*. The 1976 and 1977 prices are assumed to be the national average retail prices published in the EIA's *Monthly Energy Review*.

Physical Unit Prices: 1970 Through 1975

For 1970 through 1975, aviation gasoline prices are not available. Prices are derived by dividing the national motor gasoline prices for those years by the 1976 national motor gasoline price and applying those percent changes to the 1976 national aviation gasoline price.

Btu Prices: All Years

Aviation gasoline Btu prices are calculated by converting the physical unit prices from cents per gallon to dollars per barrel (42 gallons per barrel) and then to dollars per million Btu (5.048 million Btu per barrel).

Data Sources

Prices

1991 forward: Energy Information Administration, *Annual Energy Review 1998*, Table 5.20, row titled "Sales Prices to End Users: Aviation Gasoline."

1979–1990: Energy Information Administration, *Annual Energy Review 1994*, Table 5.20, row titled "Sales Prices to End Users: Aviation Gasoline."

1978: Energy Information Administration, *Annual Energy Review 1993*, Table 5.21, row titled "Sales Prices to End Users: Aviation Gasoline."

1976, 1977: Energy Information Administration, *Monthly Energy Review*, April 1984, page 106, column titled "Aviation Gasoline, Retail."

1970–1975: Energy Information Administration, *Annual Energy Review 1989*, Table 70, column titled "Motor Gasoline, Leaded Regular, Nominal."

Consumption

1970 forward: Energy Information Administration, Combined State Energy Data System, transportation sector, aviation gasoline consumption.

Conversion Factor: All Years

5.048 million Btu per barrel.

Distillate Fuel

Distillate fuel prices are developed for all sectors. Distillate fuel in the transportation sector is assumed to be diesel fuel. Estimates of the amount of distillate fuel consumed in each sector are taken from the Combined State Energy Data System (CSEDS). Estimated consumption for the industrial sector is adjusted to remove the estimated refinery consumption of distillate fuel in each State. (See the discussion in Section 7, "Consumption Adjustments for Calculating Expenditures," on page 417.)

Residential Sector

Residential distillate prices are developed by using a variety of data sources and several estimation methods, depending on the years involved. In all cases, physical unit prices for States are developed first, then Btu prices are calculated by using the physical unit prices and the

conversion factor. The prices contained in this series are the retail prices paid by consumers for residential heating oil, including taxes.

Physical Unit Prices: 1983 Through 1990 and 1992 Forward

For 1983 through 1990 and 1992 forward, physical unit distillate prices in cents per gallon (excluding taxes) are generally available for 24 States from the *Petroleum Marketing Annual (PMA)*. For 1989 through 1993, prices represent No. 2 fuel oil, only. For 1994 forward, prices include other No. 2 distillates. State-level prices for the States without *PMA* prices are estimated by using price data from the American Gas Association (AGA), CSEDS consumption data, and *PMA* Petroleum Administration for Defense (PAD) district prices. The estimation procedures are described below and include the addition of State general sales taxes.

1. State prices in cents per gallon are generally available from the *PMA* for the following 24 States: AK, CT, DC, DE, ID, IL, IN, MA, MD, ME, MI, MN, NH, NJ, NY, OH, OR, PA, RI, VA, VT, WA, WI, and WV. Prices for these States are converted from cents to dollars per gallon, and State general sales taxes from the Bureau of the Census and successor sources are added.
2. For the States that do not have prices in the *PMA*, prices are estimated by using AGA fuel oil prices, CSEDS consumption data, and *PMA* PAD district prices for Districts II, III, IV, and V and Subdistrict IC (all the States in PAD Subdistricts IA and IB have published prices). The following steps are used to estimate the prices:
 - a. Distillate prices from the *PMA* for PAD Districts II, III, IV, and V and Subdistrict IC are converted from cents per gallon to dollars per gallon.
 - b. The AGA lists fuel oil prices by company for the principal city served in dollars per million Btu, including State sales taxes. A simple average of the city-level prices is used to derive a State-level price for each of the States without *PMA* prices. These AGA State averages are converted from dollars per million Btu to dollars per gallon by using the AGA conversion factor of 7.194 gallons per million Btu. State general sales taxes are subtracted to give State averages comparable to the *PMA* prices.

- c. The AGA State prices derived in step 2b. are combined into PAD district averages by using CSEDS consumption to weight each State's values. This procedure gives AGA consumption-weighted average prices for PAD Districts II, III, IV, and V and Subdistrict IC that are comparable to the volume-weighted PAD district prices published in the *PMA*. The AGA PAD district averages are calculated by using only the available States; if a State does not appear in the survey, it is not included in the PAD calculation.
- d. Adjustment factors, ratios of the *PMA* PAD district price divided by the AGA derived PAD district price, are calculated for PAD Districts II, III, IV, and V, and Subdistrict IC.
- e. Prices for the States not published in the *PMA* are calculated by multiplying the AGA State prices derived in step 2b by the appropriate PAD district adjustment factor from step 2d and then adding State general sales taxes.
- f. States that do not have prices in either the *PMA* or the AGA are assigned a *PMA* PAD district price, and State general sales taxes are added. The States with assigned PAD prices are as shown in Table A13.

Physical Unit Prices: 1991

Physical unit distillate prices in cents per gallon (excluding taxes) are available for 24 States from the *PMA*. Because prices are not available from AGA for 1991, State-level prices for the remaining 27 States are estimated by using physical unit prices derived for 1990 in CSEDS and the 1991 *PMA* Petroleum Administration for Defense (PAD) district prices. The estimation procedures, including the addition of State general sales taxes, are described below.

1. State prices in cents per gallon are available from the *PMA* for the following 24 States: AK, CT, DC, DE, ID, IL, IN, MA, MD, ME, MI, MN, NH, NJ, NY, OH, OR, PA, RI, VA, VT, WA, WI, and WV. Prices for these States are converted from cents to dollars per gallon, and State general sales taxes from the Bureau of the Census' *State Government Tax Collections (SGTC)* are added.

Table A13. Distillate Residential Sector PADD Price Assignments, 1983–1990 and 1992 Forward

State	Years	Prices Assigned
AR	1988, 1993–1997	PAD District III
AZ	1992–1997	PAD District V
CA	1984, 1992–1997	PAD District V
CO	1997	PAD District IV
FL	1993, 1997	PAD District IC
GA	1996, 1997	PAD District IC
HI	1983–1990, 1992–1997	PAD District V
IA	1997	PAD District II
IL	1986	PAD District II
KS	1986, 1989, 1996, 1997	PAD District II
LA	1986, 1996, 1997	PAD District III
MS	1983, 1985, 1986, 1995–1997	PAD District III
MT	1994, 1995	PAD District IV
ND	1994, 1995, 1997	PAD District II
NE	1996	PAD District II
NM	1984–1990, 1992–1997	PAD District III
NV	1994, 1995, 1997	PAD District V
OK	1986, 1989, 1990, 1992, 1993, 1995–1997	PAD District II
SC	1997	PAD District IC
SD	1986, 1995–1997	PAD District II
TX	1992–1995, 1997	PAD District III
UT	1985, 1995	PAD District IV
WY	1994	PAD District IV

2. For the remaining 27 States that do not have prices in the *PMA*, prices are estimated by using the 1990 CSEDS physical unit prices and *PMA* PAD district prices for 1990 and 1991. The following steps are used to estimate the prices:
 - a. For 1990, the Subdistrict IC price is withheld in the *PMA* and the average of the VA and WV prices is used as the Subdistrict IC price.

- b. The 1990 State prices derived from AGA and *PMA*, as described below, are adjusted by the percentage change in the 1990 and 1991 prices for each State's *PMA* PAD district or subdistrict.
- c. The State general sales taxes from *SGTC* are added.

Physical Unit Prices: 1978 Through 1982

Procedures for the 1978 through 1982 period are similar to those for 1983 forward except for changes in data sources. Annual physical unit prices are either taken directly from the *Monthly Energy Review (MER)* or calculated from monthly regional price data, also from the *MER*. These data were collected on Form EIA-9A (formerly EIA Form 9 and FEA Form P112-M-1) and include taxes. Price data from *Platt's Oil Price Handbook and Oilmanac (Platt's)* and CSEDS consumption data for 1978 through 1982 are used to compute State prices when only regional data are available. These calculations are described step-by-step below.

1. Annual State physical unit prices are generally available from the *MER* for the same 24 States covered by the *PMA* in 1983 and forward. These 24 States compose all of Federal Regions 1, 2, 3, 5, and 10 (see Figure A2 on page 330). Prices for these States exclude taxes and are converted to dollars per gallon.
2. Of the States without *MER* prices, the 22 in Federal Regions 4, 7, 8, and 9 have annual prices estimated from the monthly Federal regional prices published in the *MER*. No regional prices are available for Federal Region 6 for the 1978 through 1982 period, and some monthly prices are missing in regions 7, 8, and 9 in 1980, 1981, and 1982.
 - a. Missing monthly prices for Federal regions are estimated with assigned prices as follows: the Region 9 November 1980 price is assigned to December 1980; an average of the Region 7 July and October 1982 prices is assigned to August and September 1982; an average of Region 8 June and September 1982 prices is assigned to July and August 1982; and an average of Region 3 August and October 1982 prices is assigned to September 1982. Imputation of missing Region 6 prices for 1978 through 1982 and missing Region 9 prices for 1981 and 1982 is discussed later.
 - b. The simple average of monthly State-level normal heating degree-day data is averaged for all the States within each of the 10 Federal regions and is used to estimate average Federal region heating degree-days. AK, DC, and HI are assigned the monthly heating degree-days from MN, MD, and FL, respectively.
 - c. Weighted average annual physical unit distillate prices for the residential sector are calculated for Federal Regions 4, 7, 8, and 9 (except for Region 9 in 1981 and 1982) by using the regional normal heating degree-days and the monthly regional prices from the *MER*.
 - d. In 1981, only March and May prices are available for Federal Region 9. To estimate the average annual price for this region, the relationship between the U.S. annual heating oil price (from the *MER*) and the U.S. March and May prices is expressed as a ratio and is used with the Region 9 March and May prices to estimate the 1981 annual Region 9 price.
 - e. City-level prices from *Platt's* are assigned to States as shown in Table A14. The assigned State-level *Platt's* prices for States are consumption-weighted into Federal regions by using residential sector consumption data from CSEDS.
 - f. Adjustment factors, ratios of the regional *MER* distillate prices to the regional *Platt's*-based distillate prices, are calculated for Federal Regions 4, 7, 8, and 9 (except for 1982).
 - g. Since there are no monthly regional distillate prices from the *MER* for Federal Region 6 for 1978 through 1982 and Federal Region 9 for 1982, the adjustment factors for these regions are based on the adjustment factors for previous time periods. The Region 6 adjustment factor for each of the years in the 1978 through 1982 period is equal to 1.1313, which is the average of the adjustment factor for the West South Central Census Division for 1976 and 1977. The Region 9 adjustment factor for 1982 is equal to 1.1995, which is the average adjustment factor for Region 9 from 1978 through 1981.
 - h. The residential sector distillate State prices for the 27 States in Federal Regions 4, 6, 7, 8, and 9 are calculated by multiplying

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L** Table A14. Platt's Prices for No. 2 Fuel Assigned to States, 1970–1982

State	Years	Assigned City or State Prices	State	Years	Assigned City or State Prices
AK	1970–1976	Los Angeles/San Francisco, CA	NC	1970–1973	Greensboro/Wilmington/Charlotte/Salisbury/Selma
	1977, 1978	Portland, OR		1974–1975	Greensboro/Wilmington/Charlotte
	1979, 1980	Seattle, WA		1976–1982	Greensboro/Wilmington
	1981, 1982	Seattle-Tacoma/Spokane, WA	ND	1970–1982	Minneapolis-St. Paul, MN
AL	1970–1974	Birmingham/Mobile/Montgomery	NE	1970	Baton Rouge/New Orleans, LA
	1975–1977	Mobile/Birmingham		1971–1973	New Orleans, LA
	1978–1982	Birmingham		1974–1982	St. Louis, MO
AR	1970–1982	Arkansas	NH	1970–1982	Portland, ME
AZ	1970–1978	Los Angeles/San Francisco, CA	NJ	1970–1975	New York/Albany/Buffalo, NY
	1979–1982	Phoenix		1976–1982	New York/Albany, NY
CA	1970–1982	Los Angeles/San Francisco	NM	1970–1972	New Mexico-West Texas
CO	1970–1976	Minneapolis-St. Paul, MN		1973–1976	Los Angeles/San Francisco, CA
	1977–1982	Denver		1977–1980	Albuquerque
CT	1970–1982	New Haven		1981, 1982	Albuquerque/Farmington
DC	1970–1982	Baltimore, MD	NV	1970–1982	Los Angeles/San Francisco, CA
DE	1970–1982	Baltimore, MD	NY	1970–1975	New York/Albany/Buffalo
FL	1970–1972	Jacksonville/Miami/Tampa/Pensacola/Panama City/Port Everglades		1976–1982	New York/Albany
	1973	Miami/Tampa/Pensacola	OH	1970–1972	Toledo/Cleveland/Zanesville/Columbus/Dayton
	1974–1975, 1981–1982	Miami/Tampa		1973–1982	Detroit, MI
	1976–1980	Miami	OK	1970–1982	Oklahoma (Group 3)
GA	1970–1973	Atlanta/Savannah/Albany/Athens/Bainbridge/Columbus/- Macon	OR	1970–1976	Los Angeles/San Francisco, CA
	1974–1982	Atlanta/Savannah		1977–1982	Portland
HI	1970–1982	Los Angeles/San Francisco, CA	PA	1970–1978	Philadelphia
IA	1970–1981	Chicago, IL		1979–1982	Philadelphia/Pittsburgh
	1982	Des Moines	RI	1970–1975	Providence
ID	1970–1976	Los Angeles/San Francisco, CA	SC	1976–1982	New Haven, CT
	1977–1982	Portland, OR		1970–1975	Charleston/Spartanburg/Belton
IL	1970–1982	Chicago		1976–1982	Charleston/Spartanburg
IN	1970–1982	Chicago, IL	SD	1970–1982	Minneapolis-St. Paul, MN
KS	1970–1973	Los Angeles/San Francisco, CA	TN	1970–1973	Chattanooga
	1974–1982	St. Louis, MO		1974–1982	New Orleans, LA
KY	1970	Baton Rouge/New Orleans, LA	TX	1970–1972	New Mexico-West Texas
	1971–1982	New Orleans, LA		1973–1978	New Orleans, LA
LA	1970	Baton Rouge/New Orleans		1979, 1980	Houston
	1971–1982	New Orleans		1981	Dallas-Fort Worth/Houston
MA	1970–1982	Boston		1982	Amarillo/Corpus Christi/Dallas-Fort Worth/Houston
MD	1970–1982	Baltimore	UT	1970–1976	Minneapolis-St. Paul, MN
ME	1970–1982	Portland		1977–1982	Salt Lake City
MI	1970–1982	Detroit	VA	1970–1973	Norfolk/Roanoke
MN	1970–1982	Minneapolis-St. Paul		1974–1982	Norfolk
MO	1970	Baton Rouge/New Orleans, LA	VT	1970–1982	Portland, ME
	1971–1973	New Orleans, LA	WA	1970–1976	Los Angeles/San Francisco, CA
	1974–1982	St. Louis		1977, 1979, 1980	Seattle
MS	1970–1973	Greenville/Meridian		1978	Portland, OR
	1974–1982	New Orleans, LA		1981–1982	Seattle-Tacoma/Spokane
MT	1970–1976	Minneapolis-St. Paul, MN	WI	1970–1982	Chicago, IL
	1977–1982	Billings	WV	1970–1973	Norfolk/Roanoke, VA
				1974–1982	Norfolk, VA
			WY	1970–1976	Minneapolis-St. Paul, MN
				1977–1982	Cheyenne

the regional adjustment factors for each year and the State-level assigned *Platt's* prices.

Physical Unit Prices: 1975 Through 1977

For the years 1975 through 1977, no State-level data are available, and regional data from Form EIA-9A are available only at the Census division level, except for Federal region prices for November and December of 1977. Using a methodology similar to that described above for the allocation of regional data to States, adjustment factors are calculated at the regional level and applied to *Platt's* price data assigned to States. The resulting prices implicitly include average regional taxes but do not reflect individual State differences.

1. Monthly regional price data for 1975 and 1976 are reported in the *MER* only for Census divisions. In 1977, however, monthly price data are reported for Census divisions for January through October and for Federal regions for November and December. The Federal region prices for November and December are assigned to their respective States and reaggregated into Census divisions in order to create a consistent set of monthly Census division prices for 1977. Annual residential sector distillate consumption data from CSEDS are used to do the reaggregation.
2. The Census division monthly price data from the *MER* for 1975, 1976, and the first 10 months of 1977 are used with the estimated Census division price data for November and December 1977 to estimate State-level prices.
 - a. Missing monthly prices in the East South Central Division for June and November 1975 and the Mountain Division for March and July 1975 are estimated by using an average of the prices for the month preceding and the month following the missing month. Missing November and December West South Central Division prices in 1977 are estimated with the assignment of the October price to both months. No monthly price data are available for the West South Central Division in 1975; step 2f., below, discusses how the calculations are handled for this division.
 - b. The monthly State-level normal heating degree-day data are averaged for the States within each Census division to estimate regional monthly heating degree-days. AK, DC, and HI are assigned the monthly heating degree-days from MN, MD, and FL, respectively.
 - c. Weighted average annual distillate prices for Census divisions are calculated by using the monthly Census division price data from the *MER* and the normal heating degree-days estimated for Census divisions.
 - d. City-level No. 2 fuel oil refinery and terminal prices from *Platt's* for 1975 through 1977 are assigned to States as shown in Table A14. The assigned *Platt's* prices for States are consumption-weighted into Census divisions by using residential sector consumption data from CSEDS.
 - e. Adjustment factors are calculated as the ratios of the *MER* distillate Census division prices to the *Platt's* distillate Census division prices.
 - f. Since there are no 1975 *MER* price data for the West South Central Division from which to calculate an adjustment factor, the 1975 adjustment factor for this region is assumed to be equal to the simple average of the West South Central adjustment factors for 1976 and 1977 (i.e., 1.1313).
 - g. The residential sector distillate State prices for all States are calculated by multiplying the regional adjustment factors for each year by the State-level assigned *Platt's* prices.

Physical Unit Prices: 1970 Through 1974

There are no regional or State-level distillate price data directly available for the 1970 through 1974 period. To estimate State prices, regional average prices are first derived from the relationship between U.S. prices and Federal region prices for 1975 through 1980. State prices are then estimated from the regional prices by using a methodology similar to that described for 1978 through 1982. The resulting prices implicitly include average regional taxes but do not reflect individual State differences.

1. The first step in the estimation of residential distillate prices for the 1970 through 1974 time period is to develop an equation that uses U.S. prices to estimate prices for Federal regions. Regression techniques are used for this purpose. U.S. prices for 1975 through 1980 from the *Annual Energy Review (AER)* are used as the independent variable for developing the equation; annual Federal region prices are used as the dependent variable. Federal region prices for 1978 through 1980 are calculated above, but *MER* prices for 1975 through 1977 are for Census divisions. To convert these annual Census division prices into Federal region prices, the estimated State prices for 1975 through 1977 are aggregated into Federal regions by using CSEDS consumption data.
2. Regression techniques are applied to the pooled Federal region price data (dependent variable) and the U.S. prices from the *AER* (independent variable) for 1975 through 1980. U.S. prices for 1970 through 1974 are input to estimate annual Federal region prices for 1970 through 1974.
3. City-level prices from *Platt's* for 1970 through 1974 are assigned to States as shown in Table A14. The assigned State-level *Platt's* prices are consumption-weighted into Federal regions by using residential sector distillate consumption data from CSEDS.
4. Adjustment factors, which are ratios of the regional *MER* distillate Federal region prices to the *Platt's*-based distillate Federal region prices, are calculated.
5. The residential sector distillate prices for all States are calculated by multiplying the regional adjustment factors for each year by the State-level assigned *Platt's* prices.

Btu Prices: All Years

Btu prices for States are calculated by converting the physical unit prices from dollars per gallon to dollars per barrel (42 gallons per barrel) and then to dollars per million Btu (5.825 million Btu per barrel). U.S. Btu prices are calculated as the average of the State Btu prices, weighted by consumption data from CSEDS.

Data Sources

Prices

1983 forward: Energy Information Administration (EIA), *Petroleum Marketing Annual 1985*, Volume 1, Table 25 (1983–1985) and annual issues of the *Petroleum Marketing Annual*, Table 36 (1986–1988), Table 38 (1989–1993), and Table 39 (1994 forward), column titled “To Residential Consumers.” The data series are also available on the EIA *Energy InfoDisc*, a CD-ROM product.

1983–1990, 1992 forward: American Gas Association, *Residential Natural Gas Market Survey* (1989, 1990, 1992 forward), and *Gas Househeating Survey* (1983–1988), Appendix 2, “Competitive Fuel Prices,” column titled “Fuel Oil.”

1970–1982: McGraw-Hill, Inc., *Platt's Oil Price Handbook and Oilmanac*, refinery and terminal prices for No. 2 fuel oil, average of highs and lows.

1975–1982: National Oceanic and Atmospheric Administration, U.S. Department of Commerce, *State, Regional, and National Monthly and Seasonal Heating Degree-Days Weighted by Population (1980 Census)*, Historical Climatology Series 5-1, table titled “1951-80 State Pop. Wgt'd Heating Degree-Days.”

1975–1982: Energy Information Administration, *Monthly Energy Review*, table titled “Residential Heating Oil Prices by Region,” February 1978, page 67 (1975, 1976); April 1980, page 83 (1977, 1978); July 1982, page 87 (1979–1982).

1970–1982: Energy Information Administration, *Annual Energy Review 1988*, Table 67, “Motor Gasoline and Residential Heating Oil Prices, 1949–1988.”

Taxes

For 1992 forward, an annual average general sales tax is calculated for each State as a simple average of the 12 monthly values. This method takes into account tax changes during the year. Prior to 1992, the State general sales tax as of September 1 of each year is used.

1996 and 1997: Federation of Tax Administrators, <http://www.taxadmin.org/fta/rate/sales.html>.

1995: The Council of State Governments, *The Book of the States*, Table 6.21.

1994: U.S. Advisory Committee on Intergovernmental Relations, *Significant Features of Fiscal Federalism*, Tables 14 and 26.

1993: Bureau of the Census, U.S. Department of Commerce, *State Tax Review*, Volume 54, No. 31, map titled "State Gasoline, Sales and Cigarette Tax Rates as of July 1, 1993."

1983–1992: Bureau of the Census, U.S. Department of Commerce, *State Government Tax Collections*, table titled "State Government Excises on General Sales, Motor Fuel, and Cigarettes, Beginning and End of Fiscal Year," column "Percentage rate, Sept. 1."

Consumption

1970 forward: Energy Information Administration, Combined State Energy Data System, residential sector distillate consumption.

Conversion Factor: All years

5.825 million Btu per barrel

Commercial Sector

Commercial sector distillate prices are estimated by using several different data sources and estimation methodologies, depending on the years involved. For 1983 forward, retail prices paid by commercial/institutional establishments (excluding taxes) for No. 2 distillate fuel are taken from the Energy Information Administration's *Petroleum Marketing Annual (PMA)*. State general sales taxes from the Bureau of the Census and successor sources are added. For 1970 through 1982, commercial distillate prices are based on refinery and terminal (wholesale) prices from *Platt's* and markups from Foster Associates, Inc. *Energy Prices: 1960-73* that include taxes. For both time periods, physical unit prices

are calculated from the data sources, and Btu prices are computed by using the physical unit prices and the conversion factor.

Physical Unit Prices: 1983 Forward

Physical unit No. 2 distillate prices in cents per gallon (excluding taxes) are generally available for 24 States from the *PMA*. State-level prices for the remaining 27 States are estimated by using the *PMA* Petroleum Administration for Defense (PAD) district prices as shown in Table A15. State general sales taxes are then added.

Table A15. Distillate Commercial Sector PADD Price Assignments, 1983 Forward

State	Years	Prices Assigned
AL	1983–1997	PAD District III
AR	1983–1997	PAD District III
AZ	1983–1997	PAD District V
CA	1983–1997	PAD District V
CO	1983–1997	PAD District IV
FL	1983–1997	PAD District IC
GA	1983–1997	PAD District IC
HI	1983–1997	PAD District V
IA	1983–1997	PAD District II
KS	1983–1997	PAD District II
KY	1983–1997	PAD District II
LA	1983–1997	PAD District III
MO	1983–1997	PAD District II
MS	1983–1997	PAD District III
MT	1983–1997	PAD District IV
NC	1983–1997	PAD District IC
ND	1983–1997	PAD District II
NE	1983–1997	PAD District II
NM	1983–1997	PAD District III
NV	1983–1997	PAD District V
OK	1983–1997	PAD District II
SC	1983–1997	PAD District IC
SD	1983–1997	PAD District II
TN	1983–1997	PAD District II
TX	1983–1997	PAD District III
UT	1983–1997	PAD District IV
WY	1983–1997	PAD District IV

Physical Unit Prices: 1970 Through 1982

Commercial sector distillate physical unit prices for 1970 through 1982 are calculated by using *Platt's* prices assigned to States and commercial sector markups estimated from *Energy Prices: 1960-73*. The resulting estimates implicitly include State-specific taxes.

1. The first step is to compute the markups. *Energy Prices* contains single price estimates for small commercial users and two price estimates for large commercial users for 10 cities: Boston, MA; Albany, NY; New York, NY; Charlotte, NC; Washington, DC; Chicago, IL; Detroit MI; Minneapolis/St. Paul, MN; St. Louis, MO; and Seattle, WA. First, a simple average of the two large commercial prices is calculated for each city except for Albany and New York. In this case, all four large commercial prices are averaged together, since cities are assigned to their respective States.
2. For the nine States covered by the *Energy Prices* data (noted in step 1), the markup of the reported prices from *Energy Prices* over the assigned *Platt's* prices (Table A14 on page 352) and the markup of the residential prices calculated above for 1970 through 1972 over the *Platt's* prices is calculated.
3. At this point, residential and commercial sector retail markups have been computed for nine States for each of the years 1970 through 1972. The next step is to calculate the average retail markup for the 3-year period for each sector. A simple average of the markup ratios is calculated.
4. The average commercial and residential sector retail markups for the nine available States are assigned, as shown in Table A16.
5. To translate the average commercial and residential markups for 1970 through 1972 into the estimated commercial sector retail markups to be used for 1970 through 1982, the relationship between these two markups is used, with the residential markups calculated for all States for each year. The calculation of the residential markups follows the same procedure used in step 2 above.
6. The commercial sector adjustment factors for each State for each of the years 1970 through 1982 are multiplied by the corresponding

Table A16. Distillate Fuel Commercial Sector Average Retail Markup Price Assignments, 1970-1972

State	City Price Assignments
AK	Seattle, WA
AL	Charlotte, NC
AR	St. Louis, MO
AZ	Seattle, WA
CA	Seattle, WA
CO	Minneapolis-St. Paul, MN
CT	Boston, MA
DC	Washington, DC
DE	Washington, DC
FL	Charlotte, NC
GA	Charlotte, NC
HI	Seattle, WA
IA	St. Louis, MO
ID	Seattle, WA
IL	Chicago, IL
IN	Chicago, IL
KS	St. Louis, MO
KY	Chicago, IL
LA	St. Louis, MO
MA	Boston, MA
MD	Washington, DC
ME	Boston, MA
MI	Detroit, MI
MN	Minneapolis-St. Paul, MN
MO	St. Louis, MO
MS	Charlotte, NC
MT	Minneapolis-St. Paul, MN
NC	Charlotte, NC
ND	Minneapolis-St. Paul, MN
NE	St. Louis, MO
NH	Boston, MA
NJ	Albany and New York, NY
NM	Seattle, WA
NV	Seattle, WA
NY	Albany and New York, NY
OH	Detroit, MI
OK	St. Louis, MO
OR	Seattle, WA
PA	Albany and New York, NY
RI	Boston, MA
SC	Charlotte, NC
SD	Minneapolis-St. Paul, MN
TN	Chicago, IL
TX	St. Louis, MO
UT	Minneapolis-St. Paul, MN
VA	Washington, DC
VT	Boston, MA
WA	Seattle, WA
WI	Chicago, IL
WV	Washington, DC
WY	Minneapolis-St. Paul, MN

Platt's prices for 1970 through 1982 to calculate the final commercial sector physical unit prices.

Btu Prices: All Years

Btu prices for States are calculated by converting the physical unit prices from cents to dollars per gallon, then to dollars per barrel (42 gallons per barrel) and, finally, to dollars per million Btu (5.825 million Btu per barrel). U.S. prices are calculated as the average of the State Btu prices, weighted by consumption data from CSEDS.

Data Sources

Prices

1983 forward: Energy Information Administration (EIA), *Petroleum Marketing Annual 1985, Volume 1*, Table 25 (1983–1985) and annual issues of the *Petroleum Marketing Annual*, Table 36 (1986–1988), Table 38 (1989–1993), and Table 39 (1994 forward), column titled “To Commercial/Institutional Consumers.” The data series are also available on the EIA *Energy InfoDisc*, a CD-ROM product.

1970–1982: McGraw-Hill, Inc., *Platt's Oil Price Handbook and Oilmanac*, refinery and terminal prices for No. 2 fuel oil, average of highs and lows.

1970–1982: Foster Associates, Inc., 1974, *Energy Prices 1960-73*, Tables 4-c and 5-b.

Taxes

For 1992 forward, an annual average general sales tax is calculated for each State as a simple average of the 12 monthly values. This method takes into account tax changes during the year. Prior to 1992, the State general sales tax as of September 1 of each year is used.

1996 and 1997: Federation of Tax Administrators, <http://www.taxadmin.org/fta/rate/sales.html>.

1995 forward: The Council of State Governments, *The Book of the States*, Table 6.21.

1994: U.S. Advisory Committee on Intergovernmental Relations, *Significant Features of Fiscal Federalism*, Tables 14 and 26.

1993: Bureau of the Census, U.S. Department of Commerce, *State Tax Review*, Volume 54, No. 31, map titled “State Gasoline, Sales and Cigarette Tax Rates as of July 1, 1993.”

1983–1992: Bureau of the Census, U.S. Department of Commerce, State Government Tax Collections, table titled “State Government Excises on General Sales, Motor Fuel, and Cigarettes, Beginning and End of Fiscal Year,” column “Percentage rate, Sept. 1.”

Consumption

1970 forward: Energy Information Administration, Combined State Energy Data System, commercial sector distillate consumption.

Conversion Factor: All Years

5.825 million Btu per barrel

Electric Utility Sector

The electric utility price for distillate fuel is the average delivered cost of No. 2 fuel oil receipts at electric utilities. (See **Light Oil, Electric Utilities** on page 372.) For 1973 forward, these prices are taken from the EIA's *Cost and Quality of Fuels for Electric Utility Plants*; for 1970 through 1972, prices from Edison Electric Institute's *Statistical Yearbook of the Electric Utility Industry* are used with regression analysis. Btu prices are developed directly from the data sources and include all applicable taxes.

Prices: 1973 Forward

Btu prices for the years 1973 forward are based on the Btu prices reported in *Cost and Quality of Fuels (C&Q)*. For 1973, 1974, and 1980

forward, Btu prices are taken directly from the data source and are converted from cents per million Btu to dollars per million Btu. For 1975 through 1979, consumption-weighted average Btu prices are calculated from prices and consumption reported separately for steam-electric plants and for combustion turbine and internal combustion units. Wherever individual State prices are unavailable, quantity-weighted Census division prices from *C&Q* are assigned, as shown in Table A17.

The *C&Q* does not have prices for AK from 1973 forward or HI from 1973 through 1982 and 1992 through 1996. Prices for AK from 1994 forward and for HI from 1994 through 1996 are estimated as the simple averages of prices reported to EIA by selected utilities on FERC Form 1 and Form EIA-412. Additional data for AK is taken from the AK Department of Community and Regional Affairs publication, *Statistical Report of the Power Cost Equalization Program*.

Prior to 1994, prices are estimated by calculating the ratio of the AK or HI prices from the *Statistical Yearbook* to the *Statistical Yearbook* U.S. price and multiplying the ratio by the *C&Q* U.S. price for each year. AK prices for 1973, 1975, and 1978 are not published in the *Statistical Yearbook* and are estimated by calculating an average of the ratios of the AK to U.S. *Statistical Yearbook* prices in adjacent years. The 1973 estimated price is based on the average ratio for 1972 and 1974, the 1975 price is based on the average ratio for 1974 and 1976, and the 1978 price is based on the average ratio for 1977 and 1979. The average ratio is then applied to the U.S. *C&Q* price for the missing year.

U.S. Btu prices for all years are calculated as the average of the State Btu prices, weighted by consumption data from CSEDS.

Prices: 1970 Through 1972

Btu prices for 1970 through 1972 are estimated by using data from *Statistical Yearbook of the Electric Utility Industry*. U.S. prices are then computed by using the State-level prices and the electric utility distillate consumption data from CSEDS.

1. Regression techniques are used to arrive at the equation for estimating electric utility sector distillate prices for the 1970 through 1972 period. AL is treated as the reference State. The regression equa-

Table A17. Distillate Electric Utility Census Division Price Assignments from *C&Q*, 1973 Forward

State	Years	Census Division
CA	1983–1985, 1987, 1988, 1990–1992, 1995–1997	Pacific
CO	1996, 1997	Mountain
CT	1973	New England
DC	1973	South Atlantic
DE	1973	South Atlantic
ID	1973, 1974, 1976, 1980–1997	Mountain
MD	1973	South Atlantic
ME	1973, 1974	New England
MT	1973–1975, 1977, 1983	Mountain
NH	1973, 1974	New England
NJ	1973, 1974	Mid-Atlantic
OR	1987, 1988, 1996	Pacific
RI	1976–1994, 1997	New England
SD	1973, 1974, 1992, 1994, 1995, 1997	W. North Central
TN	1973	E. South Central
VT	1973, 1974, 1978, 1983–1992	New England
WA	1973–1977	Pacific
WV	1973	South Atlantic
WY	1973	Mountain

tion uses *Statistical Yearbook* State-level prices for 1974 through 1980 as the independent variable and the State-level prices calculated above for 1974 through 1980 as the dependent variable. Substituting Btu prices for 1970 through 1972 from the *Statistical Yearbook* into the regression equation yields the estimated electric utility sector State-level distillate prices.

2. Wherever individual State prices are unavailable, quantity-weighted Census division prices are assigned as follows: ID in 1970 through 1972; TN in 1970; and WA in 1970 and 1971. AK in 1971 is calculated as the average of the AK price in 1970 and 1972.
3. U.S. Btu prices are calculated as the average of the State Btu prices, weighted by consumption data from CSEDS.

Data Sources

Prices

1973 forward: Energy Information Administration, *Cost and Quality of Fuels for Electric Utility Plants*; Table 6 (1973, 1974); Tables 5, 6, 12, 13 (1975–1979); Table 45 (1980–1982); Table 51 (1983, 1984); Table 41 (1985–1989); Table 14 (1990, 1991); and Table 8 (1992 forward).

1994 forward: Energy Information Administration, unpublished prices reported by utilities in AK and HI on FERC Form 1, “Annual Report of Major Electric Utilities, Licensees, and Others,” Form EIA-412, “Annual Report of Public Electric Utilities,” and AK’s *Statistical Report of the Power Cost Equalization Program*.

1970 through 1993: Edison Electric Institute, *Statistical Yearbook of the Electric Utility Industry*, table titled, “Analysis of Fuel for Electric Generation-Total Electric Utility Industry” (1970–1988) and table titled, “Fossil Fuels Used for Electric Generation Total Electric Utility Industry” (1990–1993).

Consumption

1970 forward: Energy Information Administration, Combined State Energy Data System, electric utility sector distillate consumption.

Conversion Factors

Btu prices are calculated directly from data sources; no explicit conversion factors are needed for any years for the electric utility sector.

Industrial Sector

The industrial sector distillate prices are developed by using a variety of data sources and several estimation methods, depending on the years involved. For 1983 forward, prices of No. 2 distillate fuel (excluding taxes) are reported by the *Petroleum Marketing Annual (PMA)*. State general sales taxes from the Bureau of the Census and successor sources are added. For 1970 through 1982, prices are the average cost of distillate

to manufacturing firms and implicitly include taxes that reflect individual State differences.

Physical Unit Prices: 1983 Forward

Physical unit distillate prices in cents per gallon (excluding taxes) are generally available for 24 States from the *PMA*. State-level prices for the remaining 27 States are estimated by using the *PMA* Petroleum Administration for Defense (PAD) district prices, as shown in Table A19. State general sales taxes are then added.

Physical Unit Prices: 1982

In 1984, the Bureau of the Census announced that State-level fuel cost and quantity information would no longer be published in either the *Annual Survey of Manufactures (ASM)* or *Census of Manufactures (CM)*. In addition, the *PMA*, the source for 1983 forward industrial sector distillate price data, did not contain 1982 prices. Because of this lack of price data, the 1982 industrial sector distillate prices are estimated on the basis of the relationship of industrial sector prices to electric utility sector prices for 1978 through 1981. The 1983 prices are not used in the estimation because they exclude taxes, while the 1978 through 1981 prices include taxes.

1. In order to calculate the average ratios of industrial-to-electric utility distillate prices, electric utility price assignments are made for: AK in 1978 through 1982 from WA; ID in 1979 through 1982 from MT; RI in 1978 through 1982 from CT; and VT in 1978 from ME.
2. The average 1978 through 1981 ratios of industrial-to-electric utility sector distillate prices are calculated for each State.
3. Prices for 1982 are estimated by multiplying the average ratios by the electric utility data for 1982.

Physical Unit Prices: 1971, 1974 Through 1981

For the years 1971 and 1974 through 1981, industrial sector distillate prices are calculated directly from cost and quantity data from the *Annual Survey of Manufactures (ASM)* or *Census of Manufactures (CM)* for all

Table A19. Distillate Industrial Sector PADD Price Assignments, 1983 Forward

State	Years	Prices Assigned
AL	1983–1997	PAD District III
AR	1983–1997	PAD District III
AZ	1983–1997	PAD District V
CA	1983–1997	PAD District V
CO	1983–1997	PAD District IV
DC	1994, 1997	PAD District IB
FL	1983–1997	PAD District IC
GA	1983–1997	PAD District IC
HI	1983–1997	PAD District V
IA	1983–1997	PAD District II
KS	1983–1997	PAD District II
KY	1983–1997	PAD District II
LA	1983–1997	PAD District III
ME	1997	PAD District IA
MO	1983–1997	PAD District II
MS	1983–1997	PAD District III
MT	1983–1997	PAD District IV
NC	1983–1997	PAD District IC
ND	1983–1997	PAD District II
NE	1983–1997	PAD District II
NM	1983–1997	PAD District III
NV	1983–1997	PAD District V
NY	1987	PAD District IB
OH	1983	PAD District II
OK	1983–1997	PAD District II
SC	1983–1997	PAD District IC
SD	1983–1997	PAD District II
TN	1983–1997	PAD District II
TX	1983–1997	PAD District III
UT	1983–1997	PAD District IV
WY	1983–1997	PAD District IV

States where data are available. Taxes are included in the prices. There are no missing prices for 1971. Six States are missing some *ASM* cost and quantity data for the 1974 through 1981 period. Cost and quantity data for these States are estimated as the simple average of the cost and quantity data for their adjacent States. The States, the years for which data are estimated, and the adjacent States used to make the estimation are shown in Table A18.

Table A18. Distillate Industrial Sector Price Assignments, 1974–1981

State	Years	State Prices Used
HI	1979–1981	CA
ND	1979–1981	MN, MT, SD
NM	1974–1979	AZ, CO, TX
NV	1974–1981	AZ, CA, ID, OR, UT
OK	1974–1978	AR, CO, KS, MO, TX
WY	1974–1981	CO, ID, MT, NE, SD, UT

Physical Unit Prices: 1970, 1972, 1973

Since *ASM* and *CM* data are not available for these years, the prices must be estimated. Physical unit prices are based on the ratio of 1971 *CM* prices to the 1971-assigned *Platt's* prices (Table A14 on page 352). The resulting ratios for each State are used with the *Platt's* assigned prices for 1970, 1972, and 1973 to impute prices.

1. The first step is to calculate State-level ratios between prices calculated from the 1971 *CM* cost and quantity data and the 1971 assigned *Platt's* prices. There are no missing States in either of these two sets of prices.
2. State-level physical unit prices for 1970, 1972, and 1973 are estimated by multiplying the 1971 ratio by the assigned State-level *Platt's* prices for each respective year.

Btu Prices: All Years

Btu prices for States are calculated by converting the physical unit prices from cents to dollars per gallon, then to dollars per barrel (42 gallons per barrel) and, finally, to dollars per million Btu (5.825 million Btu per barrel). U.S. Btu prices are calculated as the average of the State Btu prices, weighted by consumption data from CSEDS, adjusted for process fuel consumption.

Data Sources

Prices

1983 forward: Energy Information Administration (EIA), *Petroleum Marketing Annual 1985, Volume 1*, Table 25 (1983–1985, and annual issues of the *Petroleum Marketing Annual*, Table 36 (1986–1988), Table 38 (1989–1993), and Table 39 (1994 forward), column titled “To Industrial Consumers.” The data series are also available on the EIA *Energy InfoDisc*, a CD-ROM product.

1970–1982: McGraw–Hill, Inc., *Platt’s Oil Price Handbook and Oilmanac*, refinery and terminal prices for No. 2 fuel oil, average of highs and lows.

1971, 1977, and 1981: Bureau of the Census, U.S. Department of Commerce, *Census of Manufactures*, Table 4 (1971) and Table 3 (1977, 1981).

1974–1976 and 1978–1980: Bureau of the Census, U.S. Department of Commerce, *Annual Survey of Manufactures*, Table 3.

Taxes

For 1992 forward, an annual average general sales tax is calculated for each State as a simple average of the 12 monthly values. This method takes into account tax changes during the year. Prior to 1992, the State general sales tax as of September 1 of each year is used.

1996 and 1997: Federation of Tax Administrators, <http://www.taxadmin.org/fta/rate/sales.html>.

1995: The Council of State Governments, *The Book of the States*, Table 6.21.

1994: U.S. Advisory Committee on Intergovernmental Relations, *Significant Features of Fiscal Federalism*, Tables 14 and 26.

1993: Bureau of the Census, U.S. Department of Commerce, *State Tax Review*, Volume 54, No. 31, map titled “State Gasoline, Sales and Cigarette Tax Rates as of July 1, 1993.”

1983–1992: Bureau of the Census, U.S. Department of Commerce, *State Government Tax Collections*, table titled “State Government Excises on General Sales, Motor Fuel, and Cigarettes, Beginning and End of Fiscal Year,” column “Percentage rate, Sept. 1.”

Consumption

1970 forward: Energy Information Administration, Combined State Energy Data System, industrial sector distillate consumption.

Conversion Factor: All Years

5.825 million Btu per barrel

Transportation Sector

Consumption of distillate fuel in the transportation sector includes distillate fuel used for vessel bunkering and for military and railroad use, plus on-highway diesel fuel use. Because on-highway diesel fuel use accounts for the largest portion of this sector—increasing from 55 percent in 1970 to 82 percent in 1995—prices and expenditures are calculated by using diesel prices. State physical unit prices for 1986 forward are taken from EIA’s *Petroleum Marketing Annual (PMA)*. Physical unit prices for earlier years are calculated by using *PMA* prices and consumption data from the U.S. Department of Transportation’s *Highway Statistics* to weight monthly or quarterly prices from the U.S. Department of Agriculture’s *Agricultural Prices* into annual prices. Btu prices for all years are calculated by using the physical unit prices and the distillate conversion factor.

Physical Unit Prices: 1986 Forward

Diesel fuel physical unit prices for 1986 forward are based on the annual State-level price data available from the *PMA* for approximately 24 States and monthly tax rate information from *Highway Statistics*. Generally, the *PMA* provides prices in cents per gallon, excluding taxes, for AK, CT, DC, DE, ID, IL, IN, MA, MD, ME, MI, MN, NH, NJ, NY, OH, OR, PA, RI, VA, VT, WA, WI, and WV. State and Federal excise taxes on diesel fuel are added to *PMA* prices to derive final physical unit

prices, which are converted to dollars per gallon. In cases where the tax rate is not constant throughout the year, an annual average tax is calculated on the basis of the number of months each rate was in effect. State and local sales and other general taxes are not included.

For the remaining States for which no prices are published, the *PMA* PAD district prices for diesel fuel and motor gasoline and State motor gasoline prices are used. The State diesel fuel price is estimated as the ratio of the PAD district diesel fuel price to the PAD district motor gasoline price times the State motor gasoline price. The use of the ratio assumes that the relationship between the motor gasoline State and PAD district prices is similar to that of the diesel fuel State and PAD district prices. Motor gasoline prices to end users at all refiners' company outlets are used. When a State has no price available in that data series, the motor gasoline price to end users by all types of sellers through company outlets is used. The District of Columbia has no published diesel fuel or motor gasoline prices and is assigned the Maryland diesel fuel price for 1991 forward. State and Federal excise taxes are added as described above.

Physical Unit Prices: 1983 Through 1985

Diesel fuel physical unit prices for 1983 through 1985 are based on the annual State-level price data available from the *PMA* and monthly State and Federal tax rate information from *Highway Statistics* for 24 States. The prices for the remaining 27 States are calculated by using *Agricultural Prices* as outlined in the 1977 through 1982 methodology.

For the 24 States of AK, CT, DC, DE, ID, IL, IN, MA, MD, ME, MI, MN, NH, NJ, NY, OH, OR, PA, RI, VA, VT, WA, WI, and WV, the *PMA* provides physical unit prices, excluding taxes. In 1983 through 1985, the DC price is missing, and the MD price is assigned. In 1983, RI has no price and the PAD District IA average is assigned. A simple average of monthly State and Federal excise taxes is calculated as a combined average tax and added to the *PMA* price for a final physical unit price. State and local sales and other general taxes are not included.

Physical Unit Prices: 1977 Through 1982

Monthly prices from *Agricultural Prices* and monthly special fuels consumption data from *Highway Statistics* are collected for the States. MD prices are assigned to DC. Prices include State and local per-gallon taxes. Federal taxes and State and local sales and other general taxes are not included.

The volume-weighted annual diesel physical unit prices for States and the United States are calculated by using the monthly *Agricultural Prices* price data, weighted by the monthly *Highway Statistics* consumption data. The AK 1977 through 1982 prices are estimated on the basis of the assumption that the ratio of AK-to-U.S. diesel fuel price is the same as the ratio of the AK-to-U.S. motor gasoline price each year.

Physical Unit Prices: 1970 Through 1976

Quarterly prices from *Agricultural Prices* and monthly special fuels consumption data from *Highway Statistics* are collected for the States. Prices include State and local per-gallon taxes. Federal taxes and State and local sales taxes and other general taxes are not included.

1. Prices for 1970 through 1972 are reported in cents per gallon and must be converted to dollars per gallon. Prices for 1973 through 1976 are already reported in dollars per gallon.
2. For 1971 through 1973, State-level prices are not available for CT, MA, ME, NH, RI, and VT. Each is assigned the New England regional price for the 3 years.
3. The third quarter DE price is assigned to the missing fourth quarter DE price in 1972.
4. The combined MD/DE prices reported in 1973 are assigned to each of the States.
5. For 1970 through 1976, MD (or MD/DE) prices are assigned to DC.